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Title: *Source of the Plasmapause Shoulder*
Cluster: *Cross-Theme Theory and Data Analysis/SECTP*
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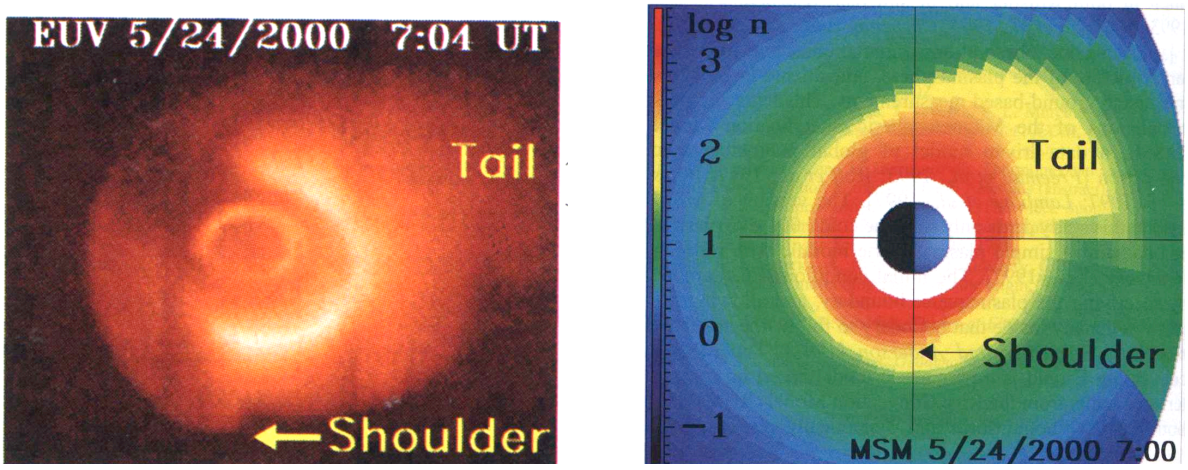
• Inner/Outer Magnetosphere Response Time Differences Affect Plasmapause Structure

Extreme Ultraviolet images of the Earth's plasmasphere from the IMAGE spacecraft discovered structures in the plasmasphere boundary, showing that the plasmapause was more spatially complex than visualized in pre-IMAGE concepts. A modeling effort partially supported by the SEC Theory Program has now reproduced one of these features, a shoulder-shaped bulge in the morning sector plasmapause, and its subsequent evolution. Electric fields generated by the Earthward edge of the plasmasheet typically shield most of the plasmasphere from the effects of the solar wind driven magnetosphere convection field. The shoulder results from an anti-sunward plasmasphere motion induced by a residual plasmaspheric electric field that doesn't decay in step with sudden reductions of the solar wind induced magnetospheric convection.

This result provides understanding of one more important link in the the chain of events that couple solar activity to our immediate geospace environment. This is another example where a previously funded study under the SEC Theory Program has played a significant role in a NASA spacecraft mission.

Snapshots of plasmasphere by IMAGE EUV imager (left) and from Magnetosphere Specification Model (right).



Reference: Goldstein, J., R. W. Spiro, P. H. Reiff, R. A. Wolf, B. R. Sandel, J. W. Freeman, and R. L. Lambour, IMF-Driven Overshielding Electric Field and the Origin of the Plamaspheric Shoulder of May 24, 2000, **Geophys. Res. Letters**, **29**, 10.1029/2001GL014534, 2002.